

P13 RECO STATUS

- <http://www-d0.fnal.gov/computing/algorithms/status/p13.html>
- History:
 - p13.00.00 - October 4 (on schedule)
 - p13.01.00 - October 25 (being tested by farms)
 - p13.02.00 being built now
- Need to freeze by the *end of the week* to meet experiment's schedule.
- On track to accomplish.
- Outstanding RECO problems:
 - No FPS in thumbnail
 - One known crash without patch - expect fix for tonight
- Tonight's build
 - New cal weights
 - Support of p12/p13 muon geometry
 - A few more patches...

"Success is dependent on effort."

-- Sophocles

Harry Melanson, CPB, 30OCT02

Major Accomplishments:

• Detectors:

- Align calorimeter with trackers ("3 cm shift")
- Fix calorimeter offline threshold "bug" so offline is same as online.
- Install new calorimeter noise file.
- Implement PDT time to distance correction.
- Correct FPS unpacking

• Tracking

- GTR + HTF tracking algorithm successfully deployed (TARC).
- CFT axial-only tracks saved.
- Command line interface to select tracking algorithms implemented.

• Muons

- Clean up muon segments.
- Loose muons in thumbnail.
- General muon id improvements.
 - Add flag to deal with duplicates
 - Take best WAMUS / FAMUS segments
 - MTC matching
 - More info

• Taus

- Multiple tau neural networks.

"Each problem that I solved became a rule, which served afterwards to solve other problems."

-- Rene Descartes

Accomplishments:

- Data tiers
 - Debug thumbnail.
 - DST and thumbnail size goals reached.
 - TMB+ deployed to support physics group requests.
- General
 - Support streaming of zero bias events.
 - Support streaming of dilepton events.
 - Old "special stream" disabled.
 - Fix many floating point errors.
 - RECO ready to have this on by default on Linux.
 - Recommend this be done.
 - Fix many other crashes.

"If we knew what we were doing, it wouldn't be called research, would it?"

-- Albert Einstein

Tests performed

- Local processing (over and over)
 - runs 155554, 160588, 165985 (~1500 events)
 - Electron and muon Z data samples (~1400 events)
 - Tight dimuon events (currently ~1K; ~14K being picked)
 - Old p11 Monte Carlo (need to update to p13)
- Various runs on real data farms, output in SAM
 - x13.00.00, x13.01.00 (coming)
- p13.00.00 recocert MC samples generated
- Marco processed 27K dielectron sample with p13.01.00, output in SAM
- Most tests focused on
 - Experts testing new features
 - Looking for crashes
 - Global performance measurements

"I cannot imagine any condition which could cause this ship to flounder.
Cannot conceive of any vital disaster happening to this vessel."

-- E.J. Smith, Captain of the Titanic, 1912

Harry Melanson, CPB, 30OCT02

Some general numbers

"OK"

P13.01.00 + local patches

| Sample | Nev | CPU sec/evt (1 GHz) | RSS Memory (MB) | VSIZE Memory (MB) | DST size (KB) | TMB size (KB) |
|---------------|-----|------------------------|--------------------|----------------------|------------------|------------------|
| Run 155554 | 200 | 19.8 | 417.0 | 536.5 | 158.5 | 16.7 |
| Run 160588 | 200 | 22.7 | 470.7 | 579.4 | 245.1 | 18.0 |
| Run 165985 | 200 | 20.4 | 411.7 | 547.2 | 138.2 | 16.8 |

"OK"

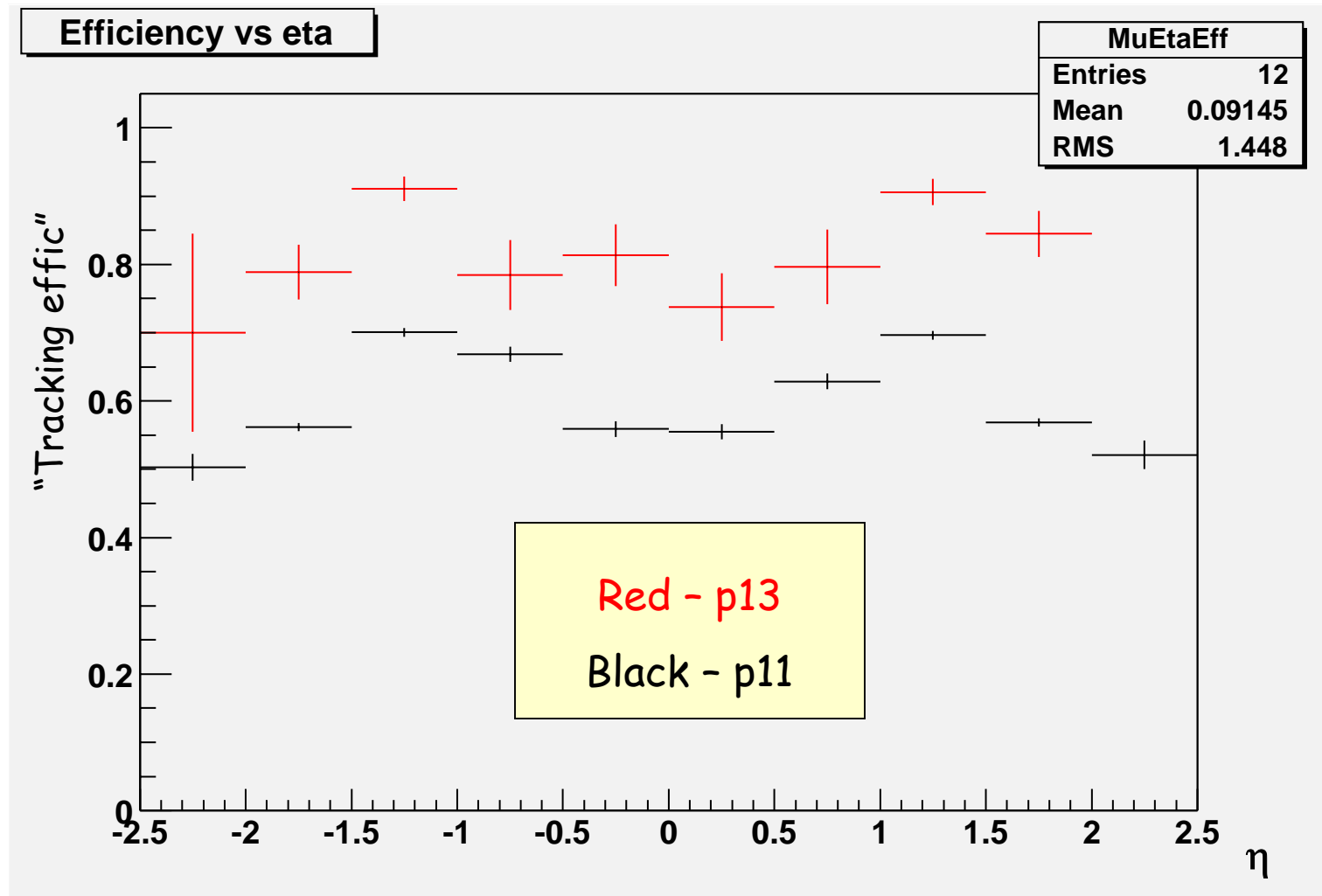
Includes TMB+

This has been growing.
Possibly due to splitting CFT clusters.
Need to investigate...

"640K ought to be enough for anybody."

-- Bill Gates, 1981.

From Erich Varnes, using tight muons to measure tracking efficiency



Very preliminary

"It wasn't as easy to get programs right as we had thought. "

-- Wilkes, 1949

Things to worry about + what we might want to do...

- **Memory usage**
 - Leaks? (Suyong investigating purify on Linux)
 - "Bloat" - need to study...
 - One improvement under study on test branch:
 - Slava has demonstrated a way to reduce RCP memory usage by ~ 100MB (p13 RECO, measured) and startup time. Alan / Paul have made modifications to improve more
 - More improvements possible (Slava working with Marc)
- **Thumbnail and TMBTree**
 - Is *everything* ok? Just need to **use and fix**.
- **Calorimeter geometry**
 - It's shifted. Are there any implicit / explicit assumptions of (0,0)? May be subtle to find problems...

"C++: The power, elegance and simplicity of a hand grenade."
-- Anonymous

Things to worry about + what we might want to do...

- Tuned HTF allowing more SMT misses increases efficiency
 - Simple answer: wait for p14
 - Real world: need to perform coherent study (a la TARC)
 - May have requests for farm time
 - Probably still p14, but...
- Improved AATrack
 - p14
 - May have requests for farm time
- Simplified control of which tracking algorithm to use in p13 should help farms with any such requests (command line: -tracking aa, etc.)

"To improve is to change, to be perfect is to change often."

-- Winston Churchill

Things to worry about + what we might want to do...

- Turn on calibration database access
 - Memory?
 - Stability?
 - Certify constants are "correct"
- Improved SMT and CFT alignment
 - Internal and external
 - F disks
- p13 Monte Carlo support
 - Need to test when MC is final
- And all the stuff we don't know about.

"They must often change, who would be constant in happiness or wisdom."

-- Confucius

Conclusion

We're not done yet...

-- The Pointy-Haired Boss to Catbert

"I saw the code for your computer program yesterday. It looked easy. Its just a bunch of typing. And half of the words were spelt wrong. And don't get me started on your over-use of colons."